

**UNITED STATES BANKRUPTCY COURT  
SOUTHERN DISTRICT OF NEW YORK**

In re:  CELSIUS NETWORK LLC, et al. <sup>1</sup>  Debtor.	Chapter 11  Case No. 22-10964 (MG) Jointly Administered
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**DECLARATION OF KC MARES**

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<sup>1</sup> The Debtors in these chapter 11 cases, along with the last four digits of each Debtor's federal tax identification number, are: Celsius Network LLC (2148); Celsius KeyFi LLC (4414); Celsius Lending LLC (8417); Celsius Mining LLC (1387); Celsius Network Inc. (1219); Celsius Network Limited (8554); Celsius Networks Lending LLC (3390); and Celsius US Holding LLC (7956). The location of Debtor Celsius Network LLC's principal place of business and the Debtors' service address in these chapter 11 cases is 121 River Street, PH05, Hoboken, New Jersey 07030.

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## I. **QUALIFICATIONS**

1. I am the President and CEO of MegaWatt Consulting, Inc. (“MegaWatt”), where I provide leadership in data center strategy, development and operations for data center operators and customers. Through my consulting at MegaWatt, I have worked for large data center providers/colocation companies, with large data center users, major customers of important data center operators, and major data center operators themselves. I have worked with several of the largest (aka “hyperscale”) builder-owner-operators and providers of data centers and Internet cloud services including Digital Realty, Equinix, Google, Facebook, Apple, Yahoo, NTT, Baidu, Rackspace, and others, as well as other large government, financial, travel industry and corporate data center operators. I have also worked on the design of several supercomputing data center projects, and the design, development, and energy procurement strategies for several large crypto-mining data centers throughout the US for bitcoin and blockchain companies. In short, I have worked with the builders and operators of a major portion of the global data center footprint. I have evaluated both the business and technical sides of data centers, including identifying the best location for clients to build out data centers, the design and operations of data centers, exploring and implementing new technologies to use in data centers and negotiating data center leases and other data center-related contracts.
2. In March 2021, I became Director of Industry Strategy for Data Centers at CPower Energy Management, a leading demand-side energy management solutions provider that helps commercial, industrial, educational, healthcare, and government organizations save on energy costs. I led the development of the data center industry vertical, which includes the development and sales of energy efficiency, energy curtailment and generation solutions, and optimization products and services to large data center operators, in which we contracted with over 1,500 MWs of data center energy solutions specifically for data center service providers and crypto-mining companies.
3. Before my time at MegaWatt, I worked for data center operators and customers to select, acquire, and negotiate wholesale and retail data center leases. For example, as CTO of Unique Infrastructure Group, I helped develop the 2,200-acre Reno Technology Park, a dedicated data center campus sold to Apple as its largest data center campus anywhere in the world with a variety of unique large-scale power solutions. At Yahoo!, I led all data center and energy procurement, acquisitions, development, and global strategy with teams in 20 countries across six continents. While working under contracted work for Google in 2004 thru 2005, I led operations and expansion strategies for the company’s first data centers and energy initiatives, as well as the analysis to acquire the main data center hub and network interconnection point in New York, and data center operations, efficiency and related work on the build of custom computing hardware. I also developed over 60 data centers worth more than

\$4 billion around the globe at Exodus Communications—at the time the world’s largest co-location data center provider supporting over one-third of global Internet traffic, and also developed the energy procurement. I am currently a partner in the development of a new \$550 million undersea fiber cable that will interconnect 11 countries between Asia and North America with a new route, new landing stations, and considered by the US government one of the “blue star” projects, meaning one of the most important new infrastructure projects.

4. Over the course of my career, I have led the design or development of more than \$10 billion in data center projects and energy procurement in more than 25 countries and have led the site selection, acquisition, and evaluation of data centers and energy strategies in nearly 30 countries. In the United States alone, I have led the design, development, construction, or operation of data centers and energy procurement for data centers in nearly every state. I have consulted for leading providers of cloud computing services; leading financial and news firms; and government entities, including the U.S. Department of Energy (“DoE”) and U.S. intelligence and national defense organizations. I have also led a data center industry initiative over many years for the US DoE while working for Lawrence Berkeley National Laboratory and led energy technology advancements for data centers with nearly every large technology company and large data center provider or operator.
5. In my 20+ year career, I have presented at dozens of industry conferences, including the Datacenter & Cloud Management Conference (Zurich 2017); the Silicon Valley Leadership Group Data Center Efficiency Summit (2009–2014); Data Center Infrastructure (Sao Paulo 2014); The Green Data Center Conference (San Diego 2010–2014, 2017; New York 2010; Dallas 2013); Data Center Dynamics (Chicago 2012); and Information Management Network, Financing, Investing & Real Estate Investment for Data Centers (Los Angeles 2011). I have provided extensive training on three continents about cutting-edge solutions for data centers and technology and have been interviewed on world TV news and national radio and for several publications, including CIO Magazine. I was the first person to be featured on the cover story for the main data center industry magazine, Data Center Dynamics Magazine, in June 2012. I was also a co-author of the definitive paper discussing data centers and other information technology infrastructure use of energy demand response: “Demand Response and Open Automated Demand Response Opportunities for Data Centers”, published in 2009.
6. I have received other awards and recognition for my work, including being named the 2017 Technologist of the Year by Nevada’s Center for Entrepreneurship and Technology, twice receiving the U.S. EPA’s EnergyStar Partner of the Year Award for innovative energy-efficiency solutions, and receiving congressional recognition from U.S. Senators Catherine Cortez Masto and Dean Heller, and Congressperson Mark Amodei. I have also led several data center industry initiatives and working

groups, including chairing the 60-person Silicon Valley Leadership Group’s Energy Committee, and I served on the Advisory Board of the University of Nevada Reno’s College of Engineering.

7. I am being compensated at a rate of \$500 per hour for preparation of this report. The opinions expressed in this report are my own, and my compensation is not dependent upon the substance of these opinions or the outcome of the litigation.
8. My curriculum vitae and a list of my trial and deposition testimony within the last four years can be found in the Appendix. I have had no publications in the past 10 years.

## II. ASSIGNMENT

9. Core Scientific, Inc. (“Core Scientific”) is a blockchain infrastructure company and Celsius Mining LLC (“Celsius”) is the mining arm of a cryptocurrency lending company. On December 18, 2020, Core Scientific executed a Master Services Agreement (“MSA”) with Celsius that covered certain services in connection with Celsius’ digital asset mining rigs, including services relating to colocation, hosting, monitoring, maintenance and repair, technical support, and heat and thermal management.<sup>2</sup>
10. In the present litigation, Celsius alleges that Core Scientific refused to perform the contractual obligations owed to Celsius under the terms of the MSA.<sup>3</sup> Celsius alleges that Core Scientific violated Order#10 of the MSA through (i) delaying the deployment of the mining rigs that Celsius supplied them, (ii) failing to notify Celsius of additional hosting capacity when it became available and (iii) adding improper surcharges called ‘power costs pass-throughs’ to its invoices following the petition date.
11. Counsel for Core Scientific, Weil Gotshal & Manges LLP, has asked me to assess the claims made by Celsius using my knowledge of the general practices observed in the cryptocurrency mining industry. I have developed such knowledge through years of work in providing advisory related to cryptocurrency mining infrastructure development. In addition to my industry experience, I have also relied on certain case specific documents shared with me by Counsel in reaching my conclusions.<sup>4</sup>

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<sup>2</sup> Declaration of Quinn Lawlor, September 28, 2022 (“Lawlor Declaration”), Exhibit A (“MSA”).

<sup>3</sup> On July 13, 2022, Celsius filed Chapter 11 bankruptcy. *Celsius Network LLC, et al.*

<sup>4</sup> Case Number: 22-10964 (MG). Retrieved October 17, 2022, from <https://cases.stretto.com/celsius/>

<sup>4</sup> The materials that I have relied upon can be found in the footnotes of this report.

### III. CRYPTOCURRENCY MINING, ELECTRICITY COSTS AND CAPACITY

#### A. Cryptocurrency mining

12. A cryptocurrency is a digital currency based on the blockchain technology.<sup>5</sup> Examples of cryptocurrencies include Bitcoin and Ethereum.<sup>6</sup> A blockchain is an immutable, chronological record of transactions (a type of digital ledger) where each transaction (or block) is securely verified and recorded into a network of computers through defined consensus mechanisms.<sup>7</sup>
13. Cryptocurrencies use two major consensus mechanisms by which all participants on a cryptocurrency network can agree on which blocks are legitimate.<sup>8</sup> Proof of Stake requires network participants to stake cryptocurrency as collateral in favor of the new block they believe should be added to the blockchain.<sup>9</sup> Proof of Work requires network participants to solve complex mathematical equations in order to secure the transactions and add them to the blockchain – a process requiring large amounts of computational resources and energy. One of the most well-known cryptocurrencies, Bitcoin, follows a Proof of Work consensus mechanism.
14. The process of participating in the verification of blockchain transactions during which new cryptocurrency is also generated as a reward is called “cryptocurrency mining”. Cryptocurrency mining is a cycle - the miners maintain and secure the blockchain, the blockchain rewards them with coins, the usefulness of coins as traded commodities or as currency for purchasing goods (mostly on internet marketplaces) provides an incentive for the miners to maintain the blockchain.
15. Proof of Work cryptocurrency mining involves vast networks of computers around the world and a tremendous amount of computing power to solve these increasingly complicated equations. Such cryptocurrency mining is typically done using specialized, high performance computer hardware known as mining rigs.<sup>10</sup>

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<sup>5</sup> *The Basics about Cryptocurrency*. Retrieved October 12, 2022, from <https://www.oswego.edu/cts/basics-about-cryptocurrency>; *What is Cryptocurrency*. Retrieved October 12, 2022, from <https://www.coinbase.com/learn/crypto-basics/what-is-cryptocurrency>; *What is cryptocurrency and how does it work?* Retrieved October 18, 2022, from <https://www.kaspersky.com/resource-center/definitions/what-is-cryptocurrency>

<sup>6</sup> *What is Cryptocurrency*. Retrieved October 12, 2022, from <https://www.coinbase.com/learn/crypto-basics/what-is-cryptocurrency>

<sup>7</sup> *What is Cryptocurrency*. Retrieved October 12, 2022, from <https://www.coinbase.com/learn/crypto-basics/what-is-cryptocurrency>

<sup>8</sup> *What is Proof-of-Work or Proof-of-Stake*. Retrieved October 12, 2022, from <https://www.coinbase.com/learn/crypto-basics/what-is-proof-of-work-or-proof-of-stake>

<sup>9</sup> *Proof of Stake Vs. Proof of Work: What's the Difference?* Retrieved October 12, 2022, from <https://www.businessinsider.com/personal-finance/proof-of-stake-vs-proof-of-work>

<sup>10</sup> *What is Mining Rig; Mining Rig Definition*. Retrieved October 12, 2022, from <https://unblock.net/glossary/mining-rig/>

16. Cryptocurrency mining computers operate nearly non-stop and consume tremendous amounts of electricity, which is converted into heat. A powerful mining server can have an electrical demand of 1,400 W or more, dissipating the equivalent quantity of heat to the data center.<sup>11</sup> A typical rack full of cryptocurrency mining servers today, the size of a standard home refrigerator, will consume between 25 and 75 KW of power<sup>12</sup>, which is equivalent to power usage of about five to ten typical US homes, yet in the space similar to a home refrigerator. Larger cryptocurrency mining facilities have thousands of these computer racks and total power capacities exceeding entire cities and grid power plants.<sup>13</sup> Most of the electricity consumed by each rack converts into heat, and this heat must be immediately removed using cool air and/or water, otherwise the servers can overheat within a few minutes. Therefore, cryptocurrency mining infrastructure is an extensive and large investment, comprising massive industrial power delivery and cooling systems, backup power systems, personnel, and services.<sup>14</sup>
17. Instead of making these heavy investments in cryptocurrency mining infrastructure and personnel themselves, mining firms typically contract with infrastructure providers to scale their computational capacity. Infrastructure providers typically offer the following services: Colocation/Hosting: The infrastructure providers (often data centers) have facilities where businesses can lease space with a set power capacity for servers and computing hardware.<sup>15</sup> Monitoring: These can include video surveillance or software that enables business owners to monitor the performance of their equipment as well as provide security.<sup>16</sup> Heat and thermal management: Servers can be cooled using three common methods: air cooling, a process that uses large arrays of industrial cooling equipment and multiple systems with precise temperature and humidity control of rack level airflow movement; immersion cooling, a process which utilizes circulation pumps and special liquids designed to work with electronics in lieu of air;<sup>17</sup> and liquid-cooling, where liquid is pumped through the rack using small tubes connected to heat exchangers on each processor and other heat producing components within each server, cooling them directly with a liquid, and usually some supplemental air cooling for the remaining

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<sup>11</sup> *Data Centers used for Bitcoin Mining*. Retrieved October 12, 2022, from <https://www.csemag.com/articles/data-centers-used-for-bitcoin-mining/>

<sup>12</sup> *Immersion Crypto Mining Rack*. Retrieved October 12, 2022, from <https://dcx.eu/ilc-crypto-rack/>

<sup>13</sup> *Cryptomining Capacity in U.S. Rivals Energy Use of Houston, Findings Show*. Retrieved October 14, 2022, from <https://www.nytimes.com/2022/07/15/climate/cryptocurrency-bitcoin-mining-electricity.html>

<sup>14</sup> *Data centers used for bitcoin mining*. Retrieved October 14, 2022, from <https://www.csemag.com/articles/data-centers-used-for-bitcoin-mining/>

<sup>15</sup> *What is Colocation (Colo)?* Retrieved October 12, 2022, from <https://www.techtarget.com/searchdatacenter/definition/colocation-colo>

<sup>16</sup> *Crypto Mining Hosting Services*. Retrieved October 12, 2022, from <https://ezblockchain.net/mining-hosting>

<sup>17</sup> *Guide To Immersion Cooling Bitcoin Mining*. Retrieved October 14, 2022, from <https://bitcoinmagazine.com/business/guide-to-immersion-cooling-bitcoin-mining>

components and residual heat.<sup>18</sup> Maintenance and Technical Support: Infrastructure providers offer onsite technical staff that can support operations of these sophisticated power and cooling systems, as well as remote access, data monitoring, etc. They also offer cleaning services to increase the lifespan of the equipment.<sup>19</sup> Insurance: Most colocation facilities have insurance which covers all operations and equipment, excluding the specific cryptocurrency mining equipment owned by the customer.<sup>20</sup>

#### **B. Electricity costs for cryptocurrency mining infrastructure providers**

18. Cryptocurrency mining and other data center facilities' operational costs are predominantly driven by the cost of electricity. <sup>21</sup> In fact, the electricity costs can vary from about 60% to more than 75% of the total operational costs.<sup>22</sup>
19. Utility companies serve electricity to consumers in the US and nearly all parts of the world. Electricity prices are highly regulated. In the US, regulators in each state review, amend, negotiate and eventually approve the prices that the utility companies want to charge their customers.<sup>23</sup> These prices, or "tariffs", include the utility company's cost of service and an agreed to return or profit on their sales. The tariff is typically expressed as cents per kilowatt hour ("kWh") and varies widely by region, the underlying sources of power generation, costs of fuel source, power demand and associated charges, or time of day or year. In the United States the total tariff for each kWh can vary by a factor of as much as 10:1 ratio (2.5 – 25 cents per kWh), affected primarily by geographic location.<sup>24</sup> Tariffs also vary for different sizes or classes of users (i.e., residential, commercial, and industrial users).<sup>25</sup> Tariffs for the generation of electricity are often adjusted each month or season.<sup>26</sup> And recently, fuel price adjustments

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<sup>18</sup> *Liquid Cooling vs. Air Cooling in the Data Center.* Retrieved October 17, 2022, from <https://www.techtarget.com/searchdatacenter/feature/Liquid-cooling-vs-air-cooling-in-the-data-center>

<sup>19</sup> *Crypto Mining Hosting Services.* Retrieved October 12, 2022, from <https://ezblockchain.net/mining-hosting/>

<sup>20</sup> *FAQ - Everything you need to know about Crypto Mining and Hosting.* Retrieved October 12, 2022, from <https://miningsky.com/faq/#1520676560217-af3b94a1-ded9>

<sup>21</sup> *Powering data centers.* Retrieved October 12, 2022, from <https://www.projectfinance.law/publications/2020/october/powering-data-centers/>

<sup>22</sup> *Over 75% of Bitcoin Miners' Earnings Going into Soaring Electricity Costs.* Retrieved October 12, 2022, from <https://economictimes.indiatimes.com/tech/technology/over-75-of-bitcoin-miners-earnings-going-into-soaring-electricity-costs/articleshow/91913745.cms?from=mdr>; *How Much Electricity Does Bitcoin Mining Use?* Retrieved October 12, 2022, from <https://www.btcwires.com/round-the-block/how-much-electricity-does-bitcoin-mining-use/>

<sup>23</sup> *Electricity and Its Regulation.* Retrieved October 14, 2022, from <https://www.econlib.org/library/Enc/ElectricityandItsRegulation.html>; *Electric Rates.* Retrieved October 18, 2022, from <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-rates>

<sup>24</sup> *Impact of a Data Center's Energy Cost on TCO.* Retrieved October 12, 2022, from <https://www.datacenterknowledge.com/archives/2012/06/21/impact-data-centers-energy-cost-tco>

<sup>25</sup> *Electric Power Monthly.* Retrieved October 14, 2022, from [https://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.php?t=epmt\\_5\\_6\\_a](https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a)

<sup>26</sup> *Electric Rates.* Retrieved October 17, 2022, from <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-rates>

have been monthly and rapidly escalating tariffs due to increase in prices and volatility of fuel procurement costs due to geopolitical and demand change.<sup>27</sup>

20. The electricity price, or tariff, contains several key components. Typically, it includes demand charges for peak power demand during the billing period, fees for transmission and distribution of electricity, fuel costs and/or market costs for the procurement of energy, fees for financing, debt repayment (especially with nuclear and hydroelectricity), maintaining the utility company's infrastructure that is needed to deliver electricity to the customers, and other regulated fees.<sup>28</sup> The tariff also includes energy charges reflecting the actual energy consumed by the customer.<sup>29</sup> Prices can vary based on time of day (on or off-peak rates) and season (summer vs winter-time rates).<sup>30</sup> Another component to the tariff is a Fuel Cost Adjustment ("FCA") that accounts for the fuel prices. FCAs allow utility companies to automatically adjust monthly costs based on fluctuations in market prices for fuel most commonly natural gas and coal, and for electricity generated by the utility and procured from other sources.<sup>31</sup> There can also be other components that factor into the price, such as metering fees, financing charges, public program charges, and energy efficiency surcharges.<sup>32</sup> Finally, local, state and regional taxes or charges are often also an added pass-through charge on utility energy bills to customers, which also vary over time.
21. The balance between demand and supply of electricity is very delicate, since electricity is not stored in any significant capacity at the wholesale grid-level and needs to be consumed as it is generated.<sup>33</sup> Utility companies continuously monitor and must balance the demand and supply of electricity. During peak usage times, utility companies offer financial incentives to customers to reduce or temporarily curtail

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<sup>27</sup> *What is Behind Soaring Energy Prices and What Happens Next?* Retrieved October 12, 2022, from <https://www.iea.org/commentaries/what-is-behind-soaring-energy-prices-and-what-happens-next>

<sup>28</sup> *Understanding Demand Charges.* Retrieved October 12, 2022, from <https://www.nyserda.ny.gov/All-Programs/Energy-Storage-Program/Energy-Storage-for-Your-Business/Understanding-Demand-Charges; Evaluating Your Utility Rate Options>; *Evaluating Your Utility Rate Options; Prices and Factors Affecting Prices.* Retrieved October 14, 2022, from <https://www.energy.gov/eere/femp/evaluating-your-utility-rate-options; Prices and Factors Affecting Prices>. Retrieved October 17, 2022, from <https://www.eia.gov/energyexplained/electricity/prices-and-factors-affecting-prices.php>

<sup>29</sup> *Prices and Factors Affecting Prices.* Retrieved October 17, 2022, from <https://www.eia.gov/energyexplained/electricity/prices-and-factors-affecting-prices.php; Evaluating Your Utility Rate Options>; *Evaluating Your Utility Rate Options.* Retrieved October 14, 2022, from <https://www.energy.gov/eere/femp/evaluating-your-utility-rate-options>

<sup>30</sup> *Prices and Factors Affecting Prices.* Retrieved October 17, 2022, from <https://www.eia.gov/energyexplained/electricity/prices-and-factors-affecting-prices.php>

<sup>31</sup> *Fuel Cost Adjustment System.* Retrieved October 12, 2022, from <https://www.tepco.co.jp/en/ep/rates/adjustment-e.html>

<sup>32</sup> *Important Definitions for Business Section.* Retrieved October 12, 2022, from [https://news.sky.com/story/leaky-homes-surcharge-homes-that-are-not-energy-efficient-will-cost-an-extra-390-after-price-cap-rises-study-says-12554501](https://www.pge.com/en_US/small-medium-business/your-account/your-bill/understand-your-bill/important-definitions/important-definitions.page; 'Leaky homes surcharge': Homes that are not energy efficient will cost an extra £390 after price cap rises, study says.</a> Retrieved October 18, 2022, from <a href=)

<sup>33</sup> *U.S. Electricity Grid & Markets.* Retrieved October 14, 2022, from <https://www.epa.gov/green-power-markets/us-electricity-grid-markets>

their energy use.<sup>34</sup> This ensures that there is balance in the demand and supply of electricity, which maintains the stability and operation of the electrical grid for all consumers – for if supply and demand are even slightly out of balance, the electrical grid will fail or have to shut down until balance is regained. These temporary reductions are called *curtailments*. Curtailment periods usually last about two to three hours and vary from a one or two to a few dozen per year.<sup>35</sup> Data centers (especially those focused on cryptocurrency mining) often take part in curtailment programs since they are large consumers of electricity who understand the sensitivity of electricity prices and have the ability to voluntarily and temporarily shut down the servers to reduce energy usage fairly rapidly for short durations.<sup>36</sup> Therefore, during curtailments, customers have the option to either reduce their use of power or pay the energy tariff charged by the utility company to continue using power. I have guided several crypto-mining and other data center operators in their participation in demand-response curtailment programs that have resulted in significant cost savings and operational choice to manage costs and provide other benefits.

### **C. Hosting capacity for cryptocurrency mining infrastructure providers**

22. An infrastructure provider's hosting capacity primarily depends on power capacity, infrastructure and the ability to procure electricity. Power capacity refers to the maximum power available for the mining rigs to operate computational equipment to mine cryptocurrency. Power capacity is delivered to each computer rack by power infrastructure which includes transformers, substations, transmission line interconnections, switchgear, uninterruptible power supplies, generators, power distribution units, cables, wires, conduits, circuit breakers, fuses, and other equipment.<sup>37</sup> Most of the energy consumed by servers and other computing equipment converts into heat. Therefore, data centers are designed with cooling system capacity to match their power capacity. Cooling equipment varies by cooling systems used within the data center, the climate zone, and operational requirements. Typically, they can consist of chillers, cooling towers, air conditioning compressors, heat exchangers, pumps, motors, fans, fan arrays, valves, pipes, tubing, cooling fluids and gasses, air exchangers, evaporators, condensers, dampers, air ducts, filters, and many other components to transfer the heat from the computing and memory chips, power supplies, storage drives and other electronic equipment to outside of the building while maintaining precise temperature and humidity controls in different stages

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<sup>34</sup> *Tapping into the Benefits of Energy Curtailment*. Retrieved October 14, 2022, from <https://www.nrg.com/insights/energy-education/tapping-into-the-benefits-of-energy-curtailment.html>; *ConnectedSolutions*. Retrieved October 14, 2022, from <https://www.nationalgridus.com/MA-Business/Energy-Saving-Programs/ConnectedSolutions>

<sup>35</sup> *ConnectedSolutions*. Retrieved October 14, 2022, from <https://www.nationalgridus.com/MA-Business/Energy-Saving-Programs/ConnectedSolutions>

<sup>36</sup> *Data Center Demand Response*. Retrieved October 14, 2022, from <https://www.eypmcfinc.com/data-center-demand-response>; *Bitcoin Mining as a Solution to the Energy Curtailment Dilemma*. Retrieved October 18, 2022, from <https://wattumanagement.com/blog/bitcoin-mining-as-a-solution-to-the-energy-curtailment-dilemma/>

<sup>37</sup> *United States Electricity Industry Primer*. Retrieved October 18, 2022, from <https://www.energy.gov/sites/default/files/2015/12/f28/united-states-electricity-industry-primer.pdf>

of the cooling system.<sup>38</sup> Core cooling is largely fluid dynamics—moving hot air up and out and cooler air through the facility.

23. The COVID-19 pandemic created supply chain issues and unanticipated delays for cryptocurrency miners and data center operators across the globe. Procurement of data center and cryptocurrency mining equipment, especially computers, processors, transformers, generators, switchgear, chillers, and other equipment was severely delayed due to supply chain disruptions.<sup>39</sup> In larger data centers, IT equipment is generally continually added and replaced or upgraded—known as equipment refresh—and data center space, electrical and cooling capacity are also continually added in phases. The ability to increase hosting capacity, refresh or replace existing equipment and provide repair and maintenance services was also restricted due to labor restrictions and supply chain issues.<sup>40</sup> Third-party manufacturers, suppliers, sub-contractors and customers were disrupted by worker absenteeism, quarantines, restrictions on employees' ability to work, office and factory closures, disruptions to ports and other shipping infrastructure, border closures, or other travel or health-related restrictions.<sup>41</sup>

#### **IV. CORE SCIENTIFIC'S ADJUSTMENTS TO PRICING IN CONSIDERATION OF CHANGES IN ELECTRIC POWER COSTS IS IN ACCORDANCE WITH GENERAL INDUSTRY PRACTICES**

24. Core Scientific's pricing agreement with the Tennessee Valley Authority ("TVA")<sup>42</sup> is a standard pricing agreement, consistent with the thousands that I have negotiated between utility companies and data centers in the past 20 years. The power tariff includes base power demand and energy charges, with varying rates for time of day and season. The tariff also includes adjustments to account for fuel and other variable costs. The utility company provides detailed formulas and information on how it uses the FCAs to adjust the price that they charge their customers for the electric power consumed.<sup>43</sup>

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<sup>38</sup> *Data center HVAC Cooling Systems*. Retrieved October 17, 2022, from <https://theengineeringmindset.com/data-center-hvac-cooling-systems/>; *Data Center Cooling: Future of Cooling Systems, Methods and Technologies*. Retrieved October 17, 2022, from <https://www.datacenters.com/news/data-center-cooling-future-of-cooling-systems-methods-and-technologies>

<sup>39</sup> *The global supply chain crisis is disrupting bitcoin miner shipments*. Retrieved October 14, 2022, from <https://www.theblock.co/post/123133/supply-chain-crisis-bitcoin-mining-shipments>; *Transformer shortage hits utilities in storm season*. Retrieved October 14, 2022, from <https://www.eenews.net/articles/transformer-shortage-hits-utilities-in-storm-season/>; *Data Center equipment shortages may ease soon - but not for good reasons*. Retrieved October 17, 2022, from <https://www.datacenterdynamics.com/en/opinions/equipment-shortages-may-ease-soon-but-not-for-good-reasons/>

<sup>40</sup> *There's a labor shortage at data centers*. Retrieved October 14, 2022, from <https://www.us.jll.com/en/trends-and-insights/workplace/theres-a-labor-shortage-at-data-centers>; *Are We In Trouble Now? Data Centers Are About To Finally Feel The Supply Chain Pinch*. Retrieved October 17, 2022, from <https://www.bisnow.com/national/news/data-center/data-centers-may-finally-feel-the-supply-chain-pinch-111754>

<sup>41</sup> *Applied Blockchain, Inc. 10-K for fiscal year ended May 31, 2022*. Retrieved October 12, 2022, from <https://www.sec.gov/Archives/edgar/data/1144879/000162828022023816/apld-20220531.htm>

<sup>42</sup> Tennessee Valley Authority, Large Direct Service Manufacturing Power Rates, October 2018.

<sup>43</sup> Tennessee Valley Authority, Large Direct Service Manufacturing Power Rates, October 2018.

25. Core Scientific and Celsius's MSA states that any increases, changes in, or introduction or administration of, any new taxes, levies, tariffs or governmental fees and charges with respect to the provision of services ("Increased Costs") could be passed through to Celsius at Core Scientific's "sole and absolute discretion", and Celsius was to pay all Increased Costs in accordance with the payment and invoicing procedures as set forth in the agreement.<sup>44</sup> I have negotiated thousands of service agreements between data centers and their customers during my career and conclude that it is standard practice to include such clauses that permit pass-through of increased tariffs along to the customer.
26. Evidence from the record shows that Core Scientific added Fuel Cost Adjustments ("FCA") to their invoices to Celsius in the form of "power costs pass-throughs". For example, an invoice dated September 15, 2022, included \$1,740,896.00 in power costs pass-throughs for August 2022.<sup>45</sup>
27. These were based on FCAs implemented by the utility companies. Core Scientific included notices from utility companies along with the invoices to Celsius that discussed the FCAs. For example, a letter dated September 13, 2022 from the Murphy Electric Power Board to Core Scientific showed the FCAs for "MSD class customers with Murphy Power Board."<sup>46</sup> A letter dated September 6, 2022 from the Tennessee Valley Authority showed the FCAs for rates at "Core Scientific's Calvert City location."<sup>47</sup> Core Scientific included information from the Energy Reliability Counsel of Texas's ("ERCOT") "Historical RTM Settlement Point Prices" for "Hubs and Load Zones".<sup>48</sup> These letters include a monthly FCA adjustment number expressed in cents per kWh, which is passed on to Celsius.
28. For example, the FCA numbers shared by Tennessee Valley Authority are as follows:

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<sup>44</sup> Lawlor Declaration, Exhibit A, Section 4F.

<sup>45</sup> Lawlor Declaration, Exhibit J, p. 160.

<sup>46</sup> Lawlor Declaration, Exhibit J, p. 185.

<sup>47</sup> Lawlor Declaration, Exhibit J, p 186.

<sup>48</sup> Lawlor Declaration, Exhibit J, pp. 187-188.

**Figure 1: FCA Portion of the kWh Rates for Core Scientific's Calvert City Location in September 2022 as shared by Tennessee Valley Authority (all figures in cents per kWh)<sup>49</sup>**

Month	Year/Cents per kWh			
	2019	2020	2021	2022
January		1.806	1.523	2.505
February		1.615	1.447	1.897
March		1.600	1.502	1.987
April		1.431	1.757	2.285
May		1.391	1.587	2.226
June		1.201	1.577	2.625
July		1.258	1.752	3.760
August	1.545	1.272	1.741	4.360
September	1.389	1.195	1.647	2.760
October	1.494	1.407	1.869	
November	1.654	1.511	2.138	
December	1.689	1.437	2.340	

29. Therefore, Fuel Cost Adjustments are part of the tariffs charged by the utility companies, and Core Scientific passed the increase in tariffs along to Celsius consistent with standard industry practices.

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<sup>49</sup> Lawlor Declaration, Exhibit J, p. 186.

**V. CONCLUSION**

30. Cryptocurrency mining requires a vast datacenter infrastructure consisting of specialized, high-performance computers, cooling systems and personnel. Cryptocurrency mining firms such as Celsius typically contract with infrastructure service providers to scale their computational capacity. Operational costs of such cryptocurrency mining infrastructure providers are predominantly driven by the price of electricity (or tariff) charged by utility companies, which can change frequently due to a variety of factors. Therefore, it is a common practice for large cryptocurrency infrastructure providers such as Core Scientific to pass along any increases in tariffs from utility companies to their customers.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on October 19, 2022, at Reno, Nevada.



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KC Mares

## VI. APPENDIX

### A. Curriculum Vitae

#### KC Mares

Leader of innovative data center solutions, developing nearly every available technology & scale from edge to >500 megaWatt sites, leading energy efficiency, generation & storage; site selection, development, acquisition & design. Creating strategic solutions with large colocation, cloud, edge, hyperscale, government & enterprises. Advising development, planning & management of >\$10 billion of projects in over 25 countries with all forms of generation, storage, and innovations. Spearhead engineering, construction, executives, finance, customers, and partners to optimize performance, leading change & overcoming challenges.

#### Data Centers, Energy & Management

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- Site Selection
- Innovative Solutions
- Design & Development
- Contract Negotiations
- Energy Generation & Storage
- Legislation & Policy
- Partnerships that Produce
- Creating & Leading Results
- Leading Cross Functional Teams
- Process & Efficiency
- Strategy, Vision & Innovation
- Efficiency Design & Operations

#### Global Data Center Energy Leader

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##### MegaWatt Consulting

##### *Data Center & Energy Consultant*

2008-present

Leading innovative design, location and energy solutions for large global data centers, battery cell production and other complex mission critical projects, improving efficiency, speed and costs.

- Completed projects for Apple, Rackspace, Google, Equinix, Digital Realty, Facebook, Bloomberg & others.
- Scaled production by over 100x leading the design, processes and build out of a lithium battery facility.
- Leading conversion of existing buildings into data centers, and procurement of energy for data centers.
- Creating new approaches to improve project success and costs for many data center colocation, enterprises and large end-user operators via site selections, negotiations of real estate and contracts.
- Leading energy procurement, development and strategies, as well as efficiency and sustainability solutions.
- Providing industry expertise with investors, executives and technology teams.

##### CPower

##### *Director of Data Center Industry Vertical*

Mar 2021-Sept 2022

Directed efficiency, distributed energy & demand-side management solutions to >1,500 MWs of data centers.

**Tesla** *Factory Design Manager* Mar 2018-Apr 2019

Led engineering of new factories and major manufacturing expansions, managing a team of over 150 engineers, architects and 3D modelers to rapid concept thru detailed design completions.

- Coordinated and directed construction, R&D, operations, procurement, manufacturing & operators to achieve timely project completions.
- Proactively managed and improved the largest and most important supplier agreement that increased annual production by over 115X in less than one year and with 50% less CapEx than the previous build-out.
- Initiated and developed an internal additive manufacturing team and line that significantly reduced lead times and cost of specialty parts and components to maintain production output and expansion timelines.
- Created and managed metrics to achieve delivery and execution success, presented weekly to executive management and adjusted priorities thru significant cash-flow challenges to support company objectives.

**Lawrence Berkeley National Lab** *Data Center Energy Program Manager* 2008-2012

Chaired the Data Center Energy Efficiency Demonstration Program and Summit, leading technology and end-user partners and 25-member committee for a 500+ attendee annual conference.

- Led this highly successful data center industry program, generating & building support and initiatives with leaders of hyperscale, colocation and other data center operators.
- Partnered with dozens of major tech companies, legislators, DOE and Executive branch to lead hundreds of industry volunteers & project leaders, leading industry solutions, legislative & regulatory changes.
- Developed multi-year sold out collaboration conference and dozens of industry leading initiatives.

**Yahoo!, Inc.** *Director of Global Data Center Strategy & Development* 2007-2008

Global data center leader for the largest Internet property (at the time), leading capacity planning, acquisitions, development, construction, engineering & project teams—driving innovation, speed of execution & lower costs.

- Led development, expansion & acquisition of >\$600M of new data centers around the globe, successfully transitioning from 80% leased to 80% built, owned and operated, providing >\$1B in annual savings. Completed the site selection, acquisition, incentives and development of data centers in Asia, Europe & U.S.
- Managed global portfolio of 100 leased & owned facilities and multi-billion-dollar annual operating budget with perfect execution, reducing costs while increasing services and improving efficiency.
- Created successful partnerships, teams, contracts and developments in over 20 countries.

**BEA Systems/Redundant Networks Sr. Mgr. of *Global Data Centers & Labs*** 2002-2004 & 2005-2007

Managed all global design, construction, expansion and consolidation of dozens of data centers and R&D labs, creating cost savings, sustainability solutions and improved partnership with internal teams.

- Completed consolidation of data centers and workforces, combining varying business unit requirements and successfully delivered multi-million-dollar savings and cross-functional work-share achievements.
- Created and presented financial plans and strategies to executive team.

**Google, Inc. (contract employee) *Data Center Operations & Energy Solutions*** 2004-2005

Managed operations and expansion of Google's first large, dedicated data centers & server manufacturing, leading build out, design, operations, security and contract equipment manufacturers.

- Led team to creative design innovations providing cost reductions and operational efficiencies.
- Evaluated and assisted in the negotiations of contracts for power, energy and operations.

**Cable & Wireless/Exodus *Director of Global Energy & Utility Management*** 2001-2002

Pioneering leader of data center energy efficiency, energy cost management, power capacity negotiations and solutions for the largest global data center operator.

- Developed and led cost-saving facility and operations solutions for the executive team.
- Established and reported key carbon, sustainability & cost performance metrics to the executive team and for the annual report, regulatory compliance, sustainability, and carbon reporting.
- Achieved significant expense reductions, energy monitoring innovations and implemented leading energy reporting tools while managing the second largest operating budget.
- Successfully positioned company positively on energy issues in print, TV and radio interviews, including *CNN, ABC World News, CIO Magazine, Industry Standard, Computer World* and *Newsweek*.

Managed multiple >\$100 million projects to schedule & budget amidst significant challenges.

## Achievement and Awards

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- 2017 NCET Technologist of the Year for development of 2,300-acre data center campus and other successes.
- Initiated & produced numerous successful conferences, driving effective collaboration & industry change.
- Keynote presenter and teacher of data center, energy and efficiency workshops around the globe.
- Chaired Silicon Valley Leadership Group's Energy Committee & 7 subcommittees, creating advocacy & leading partnerships & energy advocacy with Governor, senators, legislators, CPUC, CEC, ISO and others.

- Led the U.S. Department of Energy's IT industry energy efficiency road map with teams across the industry.
- Earned U.S. EPA's EnergyStar Partner of the Year Award twice for innovative energy-efficiency programs.
- First person to be featured in Data Center Dynamics in July 2012 cover story: "The Internet's Power Buyer".
- CEO Award for significant contributions to doubling of annual profit.

## Education

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### **University of San Diego**

Bachelor of Business Administration, Emphasis in Corporate Environmental Management (Sustainability)  
Bachelor of Arts, Ocean Studies Minor, Environmental Studies

### **Various Colleges and Universities**

*Continuing education in energy, presenting, engineering, architecture, and sustainability subjects.*

### **B. Trial and Deposition Testimony**

CoreSite v. 32 Sixth Avenue Company

Index 652792/2019

Technical Expert on behalf of CoreSite

2021–2022

Provided expert report, including rebuttal of defending technical expert, and deposition, regarding the costs of data center colocation services and network services including cross-connection fees in one of the main network data center interconnection hubs of New York City.

BladeRoom Group v. Facebook.

Case 5:15- CV-15-01370-EJD

Technical and Industry Strategy Consultant retained by Facebook

2016-2017

Provided extensive expert reports on the differences of modular and prefabricated construction techniques and benefits, as well as data center construction and materials vendor selection process and delivery and installation methods, data center ecosystem mapping, database of similar providers, construction costs and tasks, review and report of prior art, related patents and other information. Case was settled out of court.

Server Technology v. American Power Conversion

Case 3:06-CV-00698-LRH-VPC

Technical Expert on behalf of Server Technology

2011–2017

Reviewed numerous patents with initially over 90 patents in dispute, provided dozens of expert reports and rebuttals, depositions, declarations and ultimately my district court testimony in which my testimony helped to convince the jury of an award to the plaintiff. Follow up depositions and report updates under a short time frame as part of an appeal by the defendant which withheld the original judgement.